About the Operator Certification Program

In 1971 laws and regulations were enacted governing the certification of water treatment facility operation. The regulations established at what level water treatment facilities should be manned, established minimum qualifications for testing at each of the five grade levels, and established criteria for the renewal and revocation of certificates. These regulations govern a program consisting of approximately 13,000 certified water treatment operators.

In 1998 the Federal Environmental Protection Agency established guidelines for the certification and recertification of operators of community and non-transient non-community public water systems. On January 1, 2001 new state regulations were adopted to comply with these guidelines.

While the new regulations are similar to the previous regulations, there are some major changes that all operators need to be aware of. These changes include:

- Increase in fees.
- Two-step certification process which requires submittal of one application and filing fee for examination and an additional application and filing fee for certification.
- More specialized training required to qualify for T4 and T5 examination.
- Renewal period extended from two years to three years.
- Renewal fee due and payable 120 days before the certificate expiration date.
- Continuing education requirement to renew a certificate.

Program Contacts

Application Evaluation

If you have questions regarding the minimum qualifications for examination or certification please contact Janine Jones at (916) 449-5629.

Certificate Renewal

If you have questions regarding certificate renewal please contact Steve Bogart (916) 449-5615.

Visit our website:
**Frequently Asked Questions**

**If I submit an application (for either examination or certification) and I do not meet the minimum qualifications (MQs), will I get a refund of my filing fee?**

No, the application fee is a fee that is paid to evaluate your application. If you are unsure of the MQs for either taking an examination or becoming certified, please contact this office for clarification. Your application will not be evaluated over the telephone, but the analyst will explain the MQs clearly enough for you to make your own determination. (Please note: all educational requirements must be completed and verified before you are allowed to take an examination; all experience requirements must be completed and verified before you are issued a certificate.)

**When the application requests verification of specialized training or verification of a college degree, what documentation must I submit?**

When the MQs require specialized training you must submit a legible photocopy of either an official transcript (issued to you by the college) or certificate of completion. Records retrieved from the internet yourself are not acceptable proof of educational qualifications, nor are transcripts that are not issued on the college’s tamper-proof paper, or report cards.

The documentation must indicate the name of the course and the number of units (or hours) you were awarded for successful completion. Each course must be a minimum of 3 units or 36 hours of continuous formal instruction. You may not combine shorter courses to equal the 3 units or 36 hours of instruction. Also, the course completion date must be before the final filing date of the exam you wish to participate in. If you are still in the class at the time you submit your application, and the class is not completed until after the final filing date, your application will be processed for the subsequent examination.

When the MQs require verification of a college degree, a photocopy of an official transcript (issued to you by the college), which verifies attainment of that degree, must be submitted. Please note, copies of diplomas are not acceptable proof of the attainment of a degree.

**FAILURE TO PROVIDE THE EDUCATIONAL VERIFICATION, AS REQUESTED ON THE APPLICATION, WILL DELAY THE APPROVAL OF YOUR APPLICATION AND SUBSEQUENT SCHEDULING OF YOUR EXAMINATION.**

**If I have a Title I, ADA disability that allows me special testing accommodations, what documentation must I submit with my application to be allowed such accommodations?**

Before being considered for special testing accommodations, documentation from your doctor must be submitted with your application. The documentation must state the impairment, and exactly what special testing accommodation is required.

**What is considered acceptable specialized training to qualify for the examination?**

Specialized training means college level courses providing training in drinking water or wastewater quality, drinking water or wastewater treatment, drinking water distribution, or drinking water or wastewater facility operation offered by an accredited academic institution or an organization accredited by the International Association of Continuing Education Training (IACET).

If you are unsure about whether a course you have taken meets the specialized training MQs, please contact this office before submitting your application.
Where can I get “specialized training”?

The following is a list of where you might obtain specialized training. You must contact the organization directly for specific information on when courses will be given.

- Antelope Valley (Lancaster)  
  (661) 722-6300  
  www.avc.edu

- Bakersfield Community College  
  (661) 395-4011  
  www.bc.cc.ca.us

- California State University, Sacto.  
  (916) 278-6142  
  www.owp.csus.edu

- CA-NV AWWA Water College  
  (909) 481-4688  
  www.ca-nv-awwa.org

- Citrus College (Glendora)  
  (626) 914-8511  
  www.citrus.cc.ca.us

- College of the Canyons (Santa Clarita)  
  (805) 476-4100  
  www.cccn.cc.ca.us

- College of the Redwoods (Eureka)  
  (707) 445-6700  
  www.mtsac.edu

- College of the Sequoias (Visalia)  
  (559) 730-3700  
  www.sequoias.cc.ca.us

- Columbia College (Sonora)  
  (209) 588-5100  
  http://columbia.yosemite.cc.ca.us

- Hartnell Com. College (Salinas)  
  (831) 755-6700  
  www.hartnell.cc.ca.us

- Imperial Valley College  
  (760) 352-8320  
  www.imperial.cc.ca.us

- L.A. Trade Tech (Los Angeles)  
  (213) 744-9500  
  www.lattc.edu

- Mendocino College  
  (707) 468-3101  
  www.mendicino.cc.ca.us

- Merced College  
  (209) 384-6000  
  www.merced.cc.ca.us

- Mesa Com. College (San Diego)  
  (619) 388-2600  
  http://integrate.sdmesa.sdccd.cc.ca.us

- Mt. San Antonio (Walnut)  
  (909) 594-5611  
  www.mtsac.edu

- OCT, Inc.  
  (888) 863-8916  
  www.octinc.com

- Palomar Jr. College (San Diego)  
  (760) 744-1150  
  www.palomar.edu

- Santiago Canyon College (Orange)  
  (714) 564-4000  
  www.scccollege.educa

- Santa Ana College  
  (714) 564-6015  
  www.sccollege.org

- San Bernardino Valley College  
  (909) 888-6511  
  http://sbvc.sbccd.cc.ca.us

- Santa Barbara City College  
  (805) 965-0581  
  www.sb.cc.ca.us

- Santa Rosa Junior College  
  (707) 527-4011  
  www.santarosa.edu

- Shasta College (Redding)  
  (530) 352-8320  
  www.shasta.cc.ca.us

- Solano Com. College (Suisun)  
  (707) 864-7000  
  www.solano.cc.ca.us

- Yuba College, Lake Campus  
  (707) 995-7900  
  http://lakecampus.org

- Ventura College  
  (805) 654-6339  
  www.ventura.cc.ca.us

What do I need to bring with me to the examination?

- Exam admittance card

- Valid government-issued photo ID. Current picture ID is mandatory for admittance into the exam. Acceptable forms of ID are driver’s license, DMV non-driver ID, current U.S. passport, or military ID

- Simple electronic calculator (no programmable calculators or calculators with tape print-out are allowed)

- A supply of sharpened No. 2 pencils with erasers
Frequently Asked Questions (continued)

What happens if I appear late to the examination?

Doors open at the test site at 12:00 p.m., and the exam starts promptly at 1:00 p.m. There will be no admittance into the examination after the proctor has begun giving the exam instructions. If you appear after the exam has started you will be given information on how to re-schedule to the subsequent examination and instructions to contact this office the Monday immediately following the examination.

What happens if I fail to appear for an exam as scheduled?

If you fail to appear you will be required to submit a new application and filing fee. If you have an emergency the day of the exam (medical or work) a request for re-scheduling, without submitting a new application and filing fee, will be evaluated on a case-by-case basis.

If I lose my original certificate can I get a new one?

Yes. You must send a written request to our office including your name, address, operator number, grade, and the reason for your request. Send this information, along with a check or money order in the amount of $25, made out to the CDPH-OCP.

If I need to change my address of record or my name what must I do?

You must submit this information to our office in writing either through the mail or faxed to (916) 449-5654. If you are changing your name, a copy of the legal document (verifying the name change) must also be submitted.

Exam Sites

T1—T4 written exams are generally held at the following locations:

<table>
<thead>
<tr>
<th>Eureka</th>
<th>Los Angeles</th>
<th>Sacramento</th>
<th>San Diego</th>
<th>Santa Barbara</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fresno</td>
<td>Redding</td>
<td>San Bernardino Area</td>
<td>San Jose</td>
<td>Vallejo</td>
</tr>
</tbody>
</table>

Exam sites may vary slightly depending on facility availability.

T5 oral exams are held in 2 locations only — Northern California and Southern California

How often are exams given and when is the final filing date?

Exams are given twice a year, as follows:

<table>
<thead>
<tr>
<th>T1-T4 Final Filing Date</th>
<th>T1-T4 Exam Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>March 1</td>
<td>3rd Saturday in May</td>
</tr>
<tr>
<td>September 1</td>
<td>3rd Saturday in November</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>T5 Final Filing Date</th>
<th>T5 Exam Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>March 1</td>
<td>June</td>
</tr>
<tr>
<td>September 1</td>
<td>December</td>
</tr>
</tbody>
</table>

Complete applications (including appropriate verification of any required coursework) must be postmarked on or before the final filing date to be considered for the current examination period. All minimum qualifications must be fulfilled at the time of submission of the application.

IF THE FINAL FILING DATE FALLS ON A SUNDAY OR LEGAL HOLIDAY, THEN APPLICATIONS MUST BE POSTMARKED PRIOR TO THE MARCH 1 OR SEPTEMBER 1 FINAL FILING DATE.
Examination Fees

The fees below are for the evaluation of your application and participation in the examination only. (Please note, a separate fee/application will be required to obtain certification once you have passed the exam.)

<table>
<thead>
<tr>
<th>Grade</th>
<th>Exam Fee</th>
<th>Re-Exam Fee</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1</td>
<td>$50</td>
<td>$30</td>
</tr>
<tr>
<td>T2</td>
<td>$65</td>
<td>$45</td>
</tr>
<tr>
<td>T3</td>
<td>$100</td>
<td>$70</td>
</tr>
<tr>
<td>T4</td>
<td>$130</td>
<td>$95</td>
</tr>
<tr>
<td>T5</td>
<td>$155</td>
<td>$120</td>
</tr>
</tbody>
</table>

Make your check or money order payable to CDPH-OCP (do not send cash), and mail with your application to:

Department of Public Health
Operator Certification Program
P.O. Box 997377, MS#7417
Sacramento, CA 95899-7377

If for any reason your check does not clear through the Department’s Accounting Office, you will not be allowed to participate in the examination until we have received notification that all applicable fees have been paid.

Qualifying for the Examination

Before submitting your application for certification examination, please review your application to make sure you have provided ALL requested information. An incomplete application will delay approval and subsequent scheduling for examination.

**Personal information:** full name, address, date of birth, social security number, mailing address, work/home telephone numbers

**Examination Information:** grade requested, applicable fee, exam site

**Education:** date of graduation from high school, name and location of high school. Or if you are in possession of a GED certificate, date and location of attainment of GED certificate.

**Specialized training (Grades 2-5):** legible photocopies of OFFICIAL transcripts (originating from the college on tamper-proof paper) or certificates of completion MUST BE SUBMITTED to verify completion of required coursework. Certificates of completion must include the number of hours of instruction completed. Copies of report cards and unofficial transcripts are not acceptable verification of completion of specialized training.

Please make sure all educational qualifications are completed (and verified) before the examination deadline as filing fees are non-refundable.

<table>
<thead>
<tr>
<th>Grade</th>
<th>Minimum Educational Qualifications for T1 and T2 Examination</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1</td>
<td>High School or GED*</td>
</tr>
<tr>
<td>T2</td>
<td>High School or GED* AND One 3-unit (or one 36-hour) course in drinking water treatment</td>
</tr>
</tbody>
</table>

*High school/GED equivalency for Grades 1 and 2 only can be fulfilled with one year of experience as an operator of a facility that required an understanding of chemical feeds, hydraulic systems, or pumps. This must be verified with a copy of your utility’s official job description for your position.
Qualifying for the Examination (continued)

<table>
<thead>
<tr>
<th>Grade</th>
<th>Minimum Educational Qualifications for T3, T4, and T5 Examination</th>
</tr>
</thead>
<tbody>
<tr>
<td>T3</td>
<td>High School or GED And Two 3-unit (or two 36-hour) courses of specialized training one of which is in drinking water treatment and a second course in either drinking water treatment, wastewater treatment, or distribution</td>
</tr>
<tr>
<td>T4</td>
<td>Possession of a Valid T3 Certificate And Two 3-unit (or two 36-hour) courses of specialized training in drinking water treatment and a third course in either drinking water treatment, wastewater treatment, or distribution</td>
</tr>
<tr>
<td>T5</td>
<td>Possession of a Valid T4 Certificate And Two 3-unit (or two 36-hour) courses of specialized training in drinking water treatment and two additional courses in either drinking water treatment, wastewater treatment, or distribution</td>
</tr>
</tbody>
</table>

Exam Format T1-T4

Beginning in 2008, the format for the Water Treatment Operator Exam is changing. This change is the result of an exam validation study that was recently completed by the California Department of Public Health, with assistance from subject matter experts and certified water treatment operators. The study was based on a comprehensive job analysis prepared by the subject matter experts and validated by surveying certified water treatment operators. The result of this study is a new list of knowledge and abilities that a certified operator needs in order to operate a water treatment facility in California. This list has been converted to a new “Expected Range of Knowledge” and will be used to prepare the T1 – T4 exams. It is important to note that the subject matter has not changed significantly from the previous exams. In fact, we will still be using our current question bank that has also gone through a validation process. The most significant change is the number of questions and the point value for each question.

1. Each exam will consist of 100 multiple choice questions. Some of these questions will require mathematical calculations (math problems).

2. Each question is worth one point unless a calculation is required. Those questions will be worth two points.

3. A range of 15 – 20 math questions will be on each exam. The overall weight given to math on the new exams will be approximately the same as the old exams.

4. There will no longer be essay questions on the T3 and T4 exams. All questions will be multiple choice.
Exam Content T1-T4

<table>
<thead>
<tr>
<th>Grade</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Source Water</td>
<td>25</td>
<td>25</td>
<td>20</td>
<td>15</td>
</tr>
<tr>
<td>Water Treatment Processes</td>
<td>25</td>
<td>25</td>
<td>35</td>
<td>20</td>
</tr>
<tr>
<td>Operation/Maintenance</td>
<td>20</td>
<td>20</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>Laboratory Procedures</td>
<td>15</td>
<td>15</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>Regulations/Administrative Duties</td>
<td>15</td>
<td>15</td>
<td>15</td>
<td>35</td>
</tr>
</tbody>
</table>

Expected Range of Knowledge

Items marked “1-4” may be on the T1–T4 exams
Items marked “2-4” may be on the T2–T4 exams, but not on the T1 exam

Source Water

Wells/Groundwater

1-4 Knowledge of the characteristics of aquifers
1-4 Knowledge of the chemical components of groundwater
1-4 Knowledge of potential contamination in groundwater
1-4 Knowledge of well sampling techniques
1-4 Knowledge of groundwater characteristics
1-4 Ability to analyze water quality characteristics
1-4 Ability to calculate well drawdown
2-4 Ability to recognize hydrological changes
2-4 Ability to calculate a disinfectant dosage in a well
2-4 Ability to recognize the influence of surface water on a groundwater source
2-4 Ability to calculate well specific capacity
3-4 Knowledge of the source water assessment process
3-4 Ability to recognize abnormal chemical characteristics of water
3-4 Ability to calculate wellhead pressure

Surface Water/Reservoirs

1-4 Knowledge of microbial contamination
1-4 Knowledge of flow measurement devices
1-4 Ability to recognize potential sources of contamination in surface water
1-4 Ability to calculate flow rates
1-4 Ability to discriminate between normal and abnormal conditions
1-4 Ability to collect a water sample from a surface water source
1-4 Ability to calculate the volume of water contained in a storage facility
1-4 Ability to recognize abnormal odors or colors
Expected Range of Knowledge (continued)

Surface Water/Reservoirs (continued)

2-4 Knowledge of the characteristics of surface waters
2-4 Knowledge of the chemical characteristics of surface water
2-4 Knowledge of the physical characteristics of surface water
2-4 Knowledge of reservoir stratification
2-4 Knowledge of the effects of seasonal changes
2-4 Knowledge of proper surface water sampling procedures
3-4 Ability to interpret water quality reports

Raw Water Storage

1-4 Knowledge of water quality characteristics
1-4 Knowledge of bacterial contaminants
1-4 Knowledge of potential contamination sources
1-4 Ability to discriminate between normal and abnormal conditions
1-4 Ability to calculate a chemical dosage
1-4 Ability to collect a water sample
2-4 Knowledge of proper sampling procedures
2-4 Ability to measure temperature
2-4 Ability to determine water level
2-4 Ability to measure turbidity
2-4 Ability to calculate detention time

Clearwell Storage

1-4 Knowledge of water quality characteristics
1-4 Knowledge of bacterial contaminants
1-4 Knowledge of proper sampling procedures
1-4 Ability to calculate a chemical dosage
1-4 Ability to measure temperature
1-4 Ability to measure pH
1-4 Ability to determine water level
1-4 Ability to measure turbidity
2-4 Knowledge of potential contamination sources
2-4 Ability to discriminate between normal and abnormal conditions
4 Ability to calculate a CT value

Water Treatment Processes

Coagulation/Flocculation/Sedimentation

2-4 Knowledge of safe chemical handling
2-4 Knowledge of chemical compatibilities
2-4 Knowledge of maximum dose levels
2-4 Ability to calculate chemical solution concentration
2-4 Ability to analyze a water sample for turbidity
2-4 Ability to analyze a water sample for pH
**Expected Range of Knowledge (continued)**

**Water Treatment Processes**

**Coagulation/Flocculation/Sedimentation (continued)**

2-4 Ability to analyze a water sample for temperature
2-4 Ability to measure sludge depth
3-4 Knowledge of the coagulation/flocculation process
3-4 Knowledge of chemical coagulants and coagulant aids
3-4 Knowledge of coagulation/flocculation start-up/shut-down procedures
3-4 Knowledge of coagulation/flocculation adjustment procedures
3-4 Knowledge of chemical feeder calibration and adjustment
3-4 Knowledge of the mixing process
3-4 Knowledge of zeta potential
3-4 Knowledge of TOC/disinfection by-product correlation
3-4 Knowledge of enhanced coagulation
3-4 Ability to recognize normal and abnormal floc formation
3-4 Ability to measure turbidity
3-4 Ability to analyze a water sample for alkalinity
3-4 Knowledge of the sedimentation process
3-4 Knowledge of sedimentation basins
3-4 Ability to recognize and correct abnormal conditions in the sedimentation basin
3-4 Ability to operate a sedimentation basin
3-4 Ability to calculate the correct coagulant dosage
3-4 Ability to perform a jar test
4 Ability to determine sludge-depth in solids-contact unit
4 Ability to operate a solids-contact unit
4 Ability to operate an upflow clarifier

**Filtration**

1-4 Ability to interpret turbidity information
1-4 Knowledge of turbidity causing matter
2-4 Knowledge of filtration mechanisms (absorption, adsorption)
2-4 Knowledge of head-loss effects on filters
2-4 Ability to calculate filter-aid dosage
2-4 Ability to calculate filtration rate ratio
2-4 Ability to calculate filter backwash rate
3-4 Knowledge of filter porosity
3-4 Knowledge of filter media types and uses
3-4 Ability to recognize and correct problems in gravity filters
3-4 Knowledge of the diatomaceous earth process
3-4 Knowledge of filtration rates
3-4 Ability to recognize and correct problems in granular activated carbon filters
3-4 Ability to recognize and correct problems in multimedia filters
3-4 Ability to calculate filter media volume and capacity
3-4 Ability to calculate a filtration rate
3-4 Ability to calculate daily filter production
3-4 Ability to measure turbidity
4 Knowledge of filter media replacement considerations, requirements, and techniques
Expected Range of Knowledge (continued)

Water Treatment Processes (continued)

Disinfection

1-4 Knowledge of chlorine chemistry
1-4 Knowledge of breakpoint chlorination chemistry
1-4 Knowledge of proper sampling techniques
1-4 Knowledge of safe chemical handling practices
1-4 Knowledge of chlorine analysis procedures
1-4 Ability to calculate flow rates, volumes, dilution factors, feed rates, and chemical concentrations
1-4 Ability to calculate a de-chlorination dosage
1-4 Ability to analyze a water sample for free and total chlorine
1-4 Knowledge of de-chlorination practices
2-4 Knowledge of chloramines chemistry
2-4 Knowledge of ammonia feed systems
2-4 Ability to calibrate and adjust a chemical feeder pump
2-4 Ability to calculate a disinfectant dosage
2-4 Ability to calculate an ammonia/chlorine ratio
3-4 Knowledge of disinfectant properties and uses (chlorine, chlorine dioxide, chlorine gas, chloramines, ozone)
3-4 Knowledge of ozonator system operation
4 Ability to choose an appropriate disinfectant for a particular bacterial problem
4 Ability to calculate a CT value

Demineralization

3-4 Knowledge of dissolved minerals in water
3-4 Ability to analyze a sample for specific conductance
4 Knowledge of ion exchange processes
4 Ability to re-generate ion exchange system
4 Knowledge of specific conductance/TDS ratio
4 Ability to calculate a TDS value from a specific conductance reading

Corrosion Control

1-4 Knowledge of health effects of Pb and Cu
2-4 Knowledge of pH adjustment
2-4 Knowledge of corrosion causes
2-4 Knowledge of C-factor
2-4 Ability to recognize corrosion problems
2-4 Ability to calculate a chemical feed rate (dose)
2-4 Ability to set the proper chemical feed rate
3-4 Knowledge of corrosion control inhibitors
3-4 Knowledge of corrosion control chemical reactions
3-4 Knowledge of the cathodic protection process
3-4 Ability to calculate chemical solution concentration
3-4 Ability to analyze a water sample for pH
4 Ability to choose the proper corrosion control chemical for a specific problem
**Expected Range of Knowledge (continued)**

**Water Treatment Processes (continued)**

**Iron and Manganese**

2-4 Knowledge of iron and manganese removal processes  
2-4 Knowledge of proper sampling and preservation techniques  
2-4 Ability to recognize an iron and manganese problem  
2-4 Ability to calculate a chemical dosage  
3-4 Knowledge of iron and manganese oxidation chemistry  
3-4 Knowledge of oxidation techniques  
3-4 Ability to calculate chemical solution concentration  
4 Knowledge of ion exchange chemistry

**Fluoridation**

1-4 Knowledge of the health effects of fluoride  
2-4 Knowledge of back siphoning prevention measures  
2-4 Knowledge of incompatible chemicals  
2-4 Ability to calculate a chemical dosage  
3-4 Knowledge of fluoridation chemicals  
3-4 Ability to calculate chemical solution concentration  
3-4 Ability to operate a chemical feeder system  
4 Knowledge of fluoride chemistry

**Water Softening**

1-4 Knowledge of hard water causing chemicals  
2-4 Knowledge of the water softening processes  
2-4 Knowledge of acceptable water hardness range  
2-4 Ability to convert units  
2-4 Ability to calculate a chemical dosage  
3-4 Knowledge of hardness removal chemicals  
3-4 Ability to analyze a sample for water hardness  
3-4 Ability to calculate blended water concentrations  
4 Ability to calculate the hardness removal capacity of resin

**Best Available Technology**

1-4 Knowledge of waterborne pathogens  
4 Knowledge of BAT for each contaminant  
4 Knowledge of effective removal techniques other than BAT  
4 Knowledge of adverse health effects caused by contaminants  
4 Knowledge of contaminant source or formation chemistry  
4 Knowledge of pharmaceutical contaminants
Expected Range of Knowledge (continued)

Water Treatment Processes

Chemical Feeders

1-4 Ability to discriminate between normal and abnormal operation
2-4 Knowledge of the operation of chemical feeder system
2-4 Knowledge of the components of a chemical feeder system
2-4 Knowledge of back-pressure retention valves
2-4 Ability to calculate a dosage
2-4 Ability to replace components of a chemical feeder system
2-4 Ability to set speed and stroke

Pumps and Motors

1-4 Knowledge of the operation of a water pump
1-4 Knowledge of the components of a water pump
1-4 Knowledge of pump types
1-4 Ability to calculate a flow rate
3-4 Ability to discriminate between normal and abnormal operation

Blowers and Compressors

2-4 Knowledge of the operation of blowers and compressors
2-4 Ability to discriminate between normal and abnormal operation
4 Knowledge of the components of blowers and compressors

Water Meters

1-4 Knowledge of the operation of water meters
1-4 Knowledge of water meter types
1-4 Ability to discriminate between normal and abnormal operation
2-4 Knowledge of the components of water meters

Pressure Gauges

1-4 Knowledge of the operation of pressure gauges
1-4 Knowledge of head pressure
1-4 Ability to discriminate between normal and abnormal operation
1-4 Ability to replace pressure gauges

Electrical Generators

1-4 Ability to discriminate between normal and abnormal operation
2-4 Knowledge of the operation of an electrical generator

Instrumentation

2-4 Knowledge of basic SCADA system components
2-4 Knowledge of SCADA system capabilities
Expected Range of Knowledge (continued)

Water Treatment Processes

Instrumentation (continued)

2-4 Ability to determine normal operation of a SCADA system
2-4 Knowledge of the operation of on-line analyzers
2-4 Knowledge of the components of on-line analyzers
2-4 Ability to discriminate between normal and abnormal operation of on-line analyzers
2-4 Ability to repair or replace expendable parts of on-line analyzers
2-4 Knowledge of the various types of water flow meters
2-4 Knowledge of required reagents for free or total chlorine analysis, and preparation of KI solution
3-4 Knowledge of flow rates for low range and high range turbidimeters
3-4 Knowledge of cleaning and adjusting the flow (i.e., 100 mL/min) for a particle counter
4 Ability to prepare and calibrate turbidimeters with Primary standard (Formazin)
4 Ability to adjust streaming current detector to “zero” using gain knob and knowledge of what this “zero” represents
4 Ability to prepare and calibrate turbidimeters with Primary standard (Formazin)
4 Knowledge of what a streaming current detector reading dropping below or above “zero” represents with regard to coagulation dosage and raw water condition
4 Ability to standardize a dissolved ozone residual analyzer
4 Knowledge of the transfer efficiency derived from the relationship between gas phase ozone product gas and off gas analyzers
4 Ability to calculate UV dosages

Laboratory Procedures

Sampling

1-4 Knowledge of proper sampling and preservation techniques
1-4 Knowledge of appropriate sample containers and required sample sizes
1-4 Ability to follow chain-of-custody
2-4 Knowledge of maximum holding times
3-4 Ability to determine a proper sampling site
4 Knowledge of giardia and cryptosporidia sampling techniques
4 Ability to write a sampling plan

General Laboratory Practices

1-4 Knowledge of proper chemical handling techniques
2-4 Knowledge of quality control procedures
3-4 Knowledge of approved analytical procedures
3-4 Ability to follow chain-of-custody
3-4 Ability to perform dilutions
3-4 Ability to calculate a dilution factor
Expected Range of Knowledge (continued)

Laboratory Procedures (continued)

Disinfectant Analysis

1-4 Knowledge of abnormal chlorine levels
1-4 Knowledge of chlorine analysis techniques (DPD, amperometric)
3-4 Knowledge of chlorine chemistry
3-4 Knowledge of ozone chemistry
3-4 Knowledge of de-chlorination chemistry

Alkalinity Analysis

1-4 Knowledge of chemicals that contribute alkalinity to water
2-4 Ability to read a pH meter
3-4 Knowledge of abnormal alkalinity levels
3-4 Ability to use a titrator
3-4 Ability to recognize a titration end-point

pH

1-4 Knowledge of the pH scale
1-4 Knowledge of acids and bases
1-4 Ability to read a pH meter
2-4 Knowledge of temperature effects on pH
2-4 Ability to calibrate a turbidimeter

Specific Conductance

4 Knowledge of EC/TDS
4 Ability to read a specific conductance meter

Hardness

1-4 Knowledge of chemicals that contribute hardness to water
2-4 Knowledge of abnormal hardness levels
3-4 Ability to use a titrator
3-4 Ability to read a pH meter
3-4 Ability to recognize a titration end-point

Fluoride

2-4 Knowledge of abnormal levels of fluoride
3-4 Knowledge of optimal fluoride level control range

Color Analysis

3-4 Knowledge of color analysis scale
3-4 Knowledge of abnormal color levels
3-4 Knowledge of true and apparent color
4 Ability to determine small variations in color
Expected Range of Knowledge (continued)

Laboratory Procedures (continued)

Taste and Odor

2-4 Knowledge of chemicals that contribute taste and odor
2-4 Knowledge of abnormal taste and odors
3-4 Knowledge of odor analysis protocol
3-4 Ability to identify an objectionable taste or odor

Dissolved Oxygen

3-4 Knowledge of normal and abnormal dissolved oxygen levels
3-4 Knowledge of the adverse effects of abnormal dissolved oxygen levels
3-4 Knowledge of dissolved oxygen measuring devices

Algae Count

3-4 Knowledge of algae treatment techniques
4 Ability to identify algal organisms that impact the water treatment process (filter clogging, taste, and odor)

Bacteriological Analysis

2-4 Knowledge of bacteriological analysis methods
2-4 Knowledge of the presence/absence test method
2-4 Knowledge of the multiple tube fermentation method
2-4 Knowledge of Heterotrophic Plate Count (HPC)
2-4 Knowledge of the membrane filtration method
2-4 Knowledge of bacteriological testing controls
2-4 Ability to distinguish between presumptive and confirmed results

Safety

1-4 Knowledge of safe working practices
1-4 Knowledge of the use of safety equipment
1-4 Knowledge of compressed gas safety procedures
1-4 Knowledge of hazardous chemical handling
1-4 Knowledge of personal protective equipment (PPE)
1-4 Knowledge of lock-out/tag-out procedures
1-4 Ability to demonstrate safe work habits
1-4 Ability to recognize unsafe working conditions
2-4 Knowledge of electrical safety
2-4 Ability to select and operate safety equipment
3-4 Knowledge of HAZWOPER guidelines
3-4 Ability to administer first aid
3-4 Ability to administer CPR
Expected Range of Knowledge (continued)

Administrative Duties

1-4 Knowledge of drinking water regulations
1-4 Ability to communicate verbally and in writing
1-4 Ability to demonstrate safe work habits
1-4 Ability to identify potential safety hazards
1-4 Ability to organize information and follow written procedures
1-4 Ability to recognize unsafe work conditions
2-4 Knowledge of facility operation and maintenance
2-4 Knowledge of monitoring and reporting requirements
2-4 Ability to determine what information needs to be recorded
2-4 Ability to interpret and transcribe data
3-4 Knowledge of record keeping requirements
3-4 Knowledge of NSF Standards
3-4 Ability to evaluate facility performance
3-4 Ability to review reports
3-4 Ability to translate technical language into common terminology
4 Ability to calculate the cost of operations
4 Knowledge of management principles
4 Knowledge of public relations principles
4 Knowledge of principles of supervision

Regulations

1-4 Knowledge of sampling requirements
1-4 Knowledge of turbidity level requirements
1-4 Knowledge of disinfection residual requirements
1-4 Knowledge of MCLs and MRDLs of disinfectants
1-4 Ability to research and interpret MCLs
2-4 Knowledge of notification protocol and procedures
2-4 Knowledge of public notification procedures
2-4 Knowledge of recordkeeping requirements
2-4 Knowledge of corrective actions to take when regulations are violated
3-4 Knowledge of reporting procedures
3-4 Knowledge of the Consumer Confidence Report (CCR)
3-4 Knowledge of regulatory primacy issues
3-4 Knowledge of performance standards and removal requirements for the SWTR and IESWTR
4 Knowledge of the sanitary survey process
4 Knowledge of the watershed survey process
4 Knowledge of pending regulations
4 Knowledge of cryptosporidia action plan
4 Ability to develop an operations plan
4 Ability to develop an operational site sampling plan
4 Ability to conduct a Sanitary Survey
4 Ability to conduct a Watershed Survey
4 Ability to perform a filter profile analysis
4 Ability to perform a filter assessment surveillance program
4 Ability to conduct a comprehensive performance evaluation
Expected Range of Knowledge (continued)

Math

1-4 Ability to calculate well drawdown
1-4 Ability to calculate flow rates, water velocity
1-4 Ability to calculate the volume of water contained in a storage facility
1-4 Ability to calculate a chemical disinfectant dosage
1-4 Ability to determine water level
1-4 Ability to calculate volumes, dilution factors, feed rates, and chemical concentrations
1-4 Ability to calculate a de-chlorination dosage
1-4 Ability to calculate chlorine residual
1-4 Ability to convert a head pressure to water elevation
2-4 Ability to calculate well specific capacity
2-4 Ability to calculate detention time
2-4 Ability to calculate chemical solution concentration
2-4 Ability to calculate filter-aid dosage
2-4 Ability to calculate filter backwash rate
2-4 Ability to calculate an ammonia/chlorine ratio
2-4 Ability to calculate a chemical feed rate (dose) for corrosion control
2-4 Ability to calculate a chemical dosage for Fe/Mn removal, fluoridation
2-4 Ability to calculate a dosage on a chemical feeder
3-4 Ability to calculate wellhead pressure
3-4 Ability to calculate a coagulant dosage
3-4 Ability to perform a jar test
3-4 Ability to calculate filter media volume and capacity
3-4 Ability to calculate a filtration rate
3-4 Ability to calculate filter loading rate
3-4 Ability to calculate daily filter production
3-4 Ability to calculate a chemical solution concentration for Fe/Mn, fluoridation
3-4 Ability to calculate blended water chemical concentrations
3-4 Ability to calculate percentage of removal of chemical contaminants
4 Ability to calculate a CT value
4 Ability to calculate a TDS value from a specific conductance reading
4 Ability to calculate the hardness removal capacity of resin
4 Ability to calculate the cost of operations

Grade 5

The Grade 5 exam is an oral exam. You have 20 minutes to show the panel that you have the ability to administer a water treatment plant of any size and type, anywhere in California. All Grade 5 candidates, and the interview panel, will be given the following information. The panel will use these guidelines in developing their exam questions.

- During the oral exam it is assumed that you are the chief administrator of a water treatment plant or the entire utility
- Your plant or utility uses both groundwater and surface water
- This source water has all known quality problems
- You have available for your use all known technology to solve these water quality problems
Expected Range of Knowledge (continued)

Grade 5 (continued)

♦ You must deal with all the staff in your utility
♦ You must deal with the public
♦ You must deal with the press
♦ You must deal with the regulators — federal, state, county, and local
♦ You must have a complete understanding of all current and pending regulations pertinent to a water treatment plant
♦ You must know how to handle any emergency situation pertinent to your water treatment plant
♦ Remember that this is a “Department of Public Health” administered certification
♦ Remember that you will be asked to solve problems using your wit and not a screwdriver
♦ Keep in mind that since you are the chief administrator of your company, your answers should try to incorporate the viewpoint of the Department in attempting to safeguard the public health. Look for the broader picture of ensuring your operation is safe and what you do is in the best interest of the public

Suggested Reading

Office of Water Programs
California State University, Sacramento
6000 J Street
Sacramento, CA 95819-6025
(916) 278-6142

♦ Water Treatment Plant Operations, Volume 1 and 2
♦ Small Water System Operation and Maintenance

American Water Works Association
Customer Service Department
6666 West Quincy Avenue
Denver, CO 80235
(800) 926-7337

♦ Water Treatment
♦ Basic Science Concepts and Applications
♦ Introduction to Water Sources and Transmission
♦ Introduction of Water Quality Analyses
♦ Water Quality and Treatment
♦ Operator Certification Study Guide
♦ AWWA Standards — Disinfection of Water Treatment Plants, Disinfecting Water Mains

New York State Department of Health
Health Education Service
P.O. Box 7283
Albany, NY 12224

♦ Manual of Instruction for Water Treatment Plant Operators
Suggested Reading (continued)

College of the Canyons Bookstore
(805) 259-4224

- Mathematics for Treatment Plant and Water Distribution Operators

Joanne Kirkpatrick Price
Technomic Publishers
(800) 233-9936

- Basic Math Concepts for Water and Wastewater Plant Operations

Wright’s Training
P.O. Box 515
Elmira, CA 95625-0515
(707) 448-3659

- Math Text for Water and Wastewater Technology
- Sample Water Treatment Plant Operations Questions

Operator Training Certification, Inc.
P.O. Box 332
Gladstone, OR 97027
(888) 863-8916

Certification Fees

The fees below are for the evaluation of your qualifications for certification and the issuance of your certificate:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Certificate Fee</th>
<th>Dual Certificate Fee</th>
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<tbody>
<tr>
<td>T1</td>
<td>$70</td>
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<td>T2</td>
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<td>$140</td>
<td>$105</td>
</tr>
<tr>
<td>T5</td>
<td>$140</td>
<td>$105</td>
</tr>
</tbody>
</table>

Make your check or money order payable to CDPH-OCP and mail with your application to:

Department of Public Health
Operator Certification Program
MS#7417
P.O. Box 997377
Sacramento, CA 95899-7377

You have three years from the date you passed the examination to submit an application for certification. If an incomplete application is received after that date, you will be required to submit a new application and filing fee to re-take the examination.

The Dual Certificate Fee applies only to individuals who are state-certified in both drinking water treatment and drinking water distribution.
Certification Application Content

Please complete the application by filling in the information **exactly as it is requested**. The application must be typed or printed **legibly** in ink. An incomplete application will delay the approval process and subsequent issuance of your certificate.

- All personal information including your operator number and date of issuance. If you are using an acceptable college degree to fulfill a portion of the experience requirement, a photocopy of an official transcript which verifies attainment of that degree must be submitted. If you are using an *Associate's Degree (or Certificate)* the course of study must be in water or wastewater technology. If you are using a *Bachelor's Degree* the major must be in biology, chemical engineering, chemistry, civil engineering, environmental engineering, microbiology, public health, or sanitary engineering.

- Employment timeframe, number of hours in a week you perform water treatment operator duties, and a detailed description of what those duties entail(ed). This section **MUST** be filled in by the applicant — do not fill in this section by stating “see attachment” (referring to the job description).

- The original signature of your current (or past) supervisor, as shown on the utility’s organization chart, **verifying the timeframe of employment, number of hours spent performing water treatment operator duties, and what those duties entail(ed)**.

- The **rating letter** from the Drinking Water Program field office that has classified your facility as a T1-T5 water treatment plant.

- An organization chart (originating from the utility) which includes your name and position title along with your supervisor’s name and position title.

- If you are using experience as a certified wastewater treatment operator (not an OIT) you must submit a copy of your wastewater treatment operator certificate which covers the timeframe of employment being claimed.

**ALL** experience being claimed for credit must be verified with the *utility organization chart, rating letter, job duties, and supervisor’s original signature*.

---

**ANY MISREPRESENTATION OF THE INFORMATION SUBMITTED ON THE APPLICATION MAY RESULT IN REVOCATION OF THE CERTIFICATE GRANTED, PURSUANT TO SECTION 106876 OF THE HEALTH AND SAFETY CODE.**
Qualifying for Certification

<table>
<thead>
<tr>
<th>Grade</th>
<th>Site and Grade Specific Experience</th>
<th>General Operator Experience</th>
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<td>T1</td>
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<tr>
<td>T2</td>
<td>None</td>
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<tr>
<td>T3</td>
<td>1 year of operator experience</td>
<td>AND</td>
</tr>
<tr>
<td></td>
<td>working as a certified T2 operator</td>
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<tr>
<td></td>
<td>for a T2 facility or higher</td>
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<tr>
<td></td>
<td>(may be substituted for (3) below)</td>
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</tr>
<tr>
<td></td>
<td>AND</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 additional year of operator experience</td>
<td>working as a certified treatment operator (may be substituted with (1), (2), and (4) below)</td>
</tr>
<tr>
<td>T4</td>
<td>1 year of operator experience</td>
<td>AND</td>
</tr>
<tr>
<td></td>
<td>working as a shift or chief operator, while holding a valid T3 operator certificate, at a T3 facility or higher (may be substituted for (3) below)</td>
<td>3 additional years of operator experience working as a certified treatment operator (may be substituted with (1), (2), and (4) below)</td>
</tr>
<tr>
<td>T5</td>
<td>2 years of operator experience</td>
<td>AND</td>
</tr>
<tr>
<td></td>
<td>working as a shift or chief operator, while holding a valid T4 operator certificate, at a T4 facility or higher (no substitutions)</td>
<td>3 additional years of operator experience working as a certified treatment operator (may be substituted with (1), (2), and (4) below)</td>
</tr>
</tbody>
</table>

Experience substitutions for certification, as referenced above.

(1) A degree earned at an accredited academic institution may be substituted as follows:
   
   (a) Associate Degree or Certificate in Water or Wastewater Technology that includes at least 15 units of physical, chemical, or biological science may be used to fulfill 1 year of general operator experience.
   
   (b) Bachelor Degree in biology, chemical engineering, chemistry, civil engineering, environmental engineering, microbiology, public health, and sanitary engineering may be used to fulfill 1 1/2 years of general operator experience.
   
   (c) Masters Degree in biology, chemical engineering, chemistry, civil engineering, environmental, microbiology, public health, and sanitary engineering may be used to fulfill 2 years of general operator experience.

(2) A certified operator may substitute, on a day-for-day basis, experience gained while working with lead responsibility for water quality related projects or research (i.e., pilot plant).

(3) If an applicant has a Bachelor of Science or Master of Science Degree, completion of a comprehensive operator training program, pursuant to Section 63800 (h), may be substituted for the required experience.

(4) Experience gained as a certified wastewater treatment operator (not an OIT) may be used to substitute up to 2 years of the general experience requirement. Wastewater treatment operator experience is credited on a two-for-one basis (2 months in wastewater = 1 month in drinking water).
How to Renew Your Certificate

Once you have obtained certification you must pay a renewal fee and obtain continuing education to remain certified. Renewals are for a three year period. Renewal fees are due four months prior to the expiration date of the certificate.

A courtesy renewal reminder is mailed to your address of record, but it is your responsibility to pay the renewal fee and provide information regarding your continuing education on time even if you do not receive the renewal reminder.

If you are only certified as a water treatment operator, you will pay the fee listed under Treatment Only; if you are also state-certified as a distribution operator, the fee you will pay is listed under Dual-Certified.

<table>
<thead>
<tr>
<th>Grade</th>
<th>Treatment Only</th>
<th>Dual-Certified</th>
<th>Number of Contact Hours Required</th>
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<tbody>
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<td>T1</td>
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<td>$55</td>
<td>12</td>
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<tr>
<td>T2</td>
<td>$80</td>
<td>$60</td>
<td>16</td>
</tr>
<tr>
<td>T3</td>
<td>$120</td>
<td>$90</td>
<td>24</td>
</tr>
<tr>
<td>T4</td>
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<td>$105</td>
<td>36</td>
</tr>
<tr>
<td>T5</td>
<td>$140</td>
<td>$105</td>
<td>36</td>
</tr>
</tbody>
</table>

Note: 1 CEU = 10 hours of instruction

To maintain your certification you will be required to have completed continuing education hours. All operators must complete the continuing education requirements in order to renew their certificate.

The continuing education must have been obtained during the three years since your last renewal.

Operators possessing both water treatment and distribution certificates may apply the same continuing education to both certificate renewals as long as it was obtained during the renewal period of both.

Continuing education is considered appropriate for renewal purposes when it “transmits information related to the operation of a treatment facility and/or distribution system.”

You should keep a copy of the certificate of completion, course syllabus or outline, and maintain a record of the instructor’s name, the location of the course, the number of contact hours, and the date it was completed. This information will be requested when it’s needed.

Where Can I Obtain Continuing Education for Renewal?

The following is a list of continuing education providers that offer continuing education contact hours. This list only represents the providers of which we are aware, and is not comprehensive. Contact the training provider to confirm class time, location, cost, and contact hours awarded.
Where Can I Obtain Continuing Education for Renewal? (continued)

<table>
<thead>
<tr>
<th>Type</th>
<th>Training Provider</th>
<th>Class Title</th>
<th>Contact Hours</th>
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<tr>
<td>Correspondence</td>
<td>California State Univ.—Sacramento</td>
<td>Water Treatment Plant Operations Volume 1</td>
<td>90</td>
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<tr>
<td></td>
<td>(916) 278-6142</td>
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<td></td>
<td><a href="http://www.owp.csus.edu/">http://www.owp.csus.edu/</a></td>
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<tr>
<td>Correspondence</td>
<td>California State Univ.—Sacramento</td>
<td>Water Treatment Plant Operations Volume 2</td>
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<td>(916) 278-6142</td>
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<tr>
<td>Correspondence</td>
<td>California State Univ.—Sacramento</td>
<td>Small Water System Operation and Maintenance</td>
<td>90</td>
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<tr>
<td></td>
<td>(916) 278-6142</td>
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<td>Correspondence</td>
<td>California State Univ.—Sacramento</td>
<td>Water Distribution Operation and Maintenance</td>
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<td></td>
<td>(916) 278-6142</td>
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<tr>
<td>Correspondence</td>
<td>California State Univ.—Sacramento</td>
<td>Utility Management</td>
<td>45</td>
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<td></td>
<td>(916) 278-6142</td>
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<td>Various</td>
<td>CA-NV-AWWA</td>
<td>Various</td>
<td>Various</td>
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<tr>
<td></td>
<td>(909) 481-4688</td>
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<td><a href="http://www.ca-nv-awwa.org">http://www.ca-nv-awwa.org</a></td>
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<tr>
<td>Various</td>
<td>California Rural Water Association</td>
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<tr>
<td></td>
<td>(916) 553-4900</td>
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<td><a href="http://www.calruralwater.org">http://www.calruralwater.org</a></td>
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<tr>
<td>Correspondence</td>
<td>(480) 705-9315</td>
<td>Distribution</td>
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<tr>
<td></td>
<td><a href="http://www.tlch2o.com">http://www.tlch2o.com</a></td>
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<tr>
<td>Correspondence</td>
<td><a href="http://www.tlch2o.com">http://www.tlch2o.com</a></td>
<td>Safe Drinking Water Rules and Regulations</td>
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<tr>
<td>Correspondence</td>
<td><a href="http://www.tlch2o.com">http://www.tlch2o.com</a></td>
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<td>Correspondence</td>
<td><a href="http://www.tlch2o.com">http://www.tlch2o.com</a></td>
<td>Point of Use Water Treatment</td>
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<td>Correspondence</td>
<td><a href="http://www.tlch2o.com">http://www.tlch2o.com</a></td>
<td>Distribution Foreman</td>
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<td>Correspondence</td>
<td><a href="http://www.tlch2o.com">http://www.tlch2o.com</a></td>
<td>Backflow Awareness</td>
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<tr>
<td>Computer-Based</td>
<td>Micar, Inc.</td>
<td>Basic Water Math</td>
<td>6</td>
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<tr>
<td></td>
<td>(800) 318-4739</td>
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<td><a href="http://www.h2o-ed.com">www.h2o-ed.com</a></td>
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<tr>
<td>On-line course</td>
<td>AWWA</td>
<td>Coagulation, Flocculation, and Sedimentation Basics</td>
<td>3</td>
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### Where Can I Obtain Continuing Education for Renewal? (continued)

<table>
<thead>
<tr>
<th>Type</th>
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<th>Class Title</th>
<th>Contact Hours</th>
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<td>On-line course</td>
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<td>Filtration Basics</td>
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<td>Hydraulics</td>
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<td>On-line course</td>
<td>360water.com</td>
<td>Confined Space Entry</td>
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<td>360water.com</td>
<td>U.S. Water and Wastewater Utility Industry</td>
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<td>On-line course</td>
<td>360water.com</td>
<td>UV Disinfection</td>
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<td>Drinking Water Precipitation</td>
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<tr>
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<td>Harry Brown Training</td>
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